

Chestnut-breasted Shelduck.
Black Duck.
Grey Teal.
Black-tailed Native Hen (once).
Hoary-headed Grebe (once).

Grey Teal bred in the vicinity.

OTHER SPECIES.

Other species of birds recorded at or near Bilbarin, but not included in any of the foregoing lists, are:

Owlet-nightjar (once).
White-headed Stilt (once, in passage).
Southern Stone Curlew.
Black Swan (in passage).
Wedge-tailed Eagle (once).
Boobook Owl.
Yellow-plumed Honeyeater (once).
Typo sp. (once).
Brown Songlark (once).
Pied Butcher-bird (once).

CONCLUSION.

All the tables given above suggest a denser and more varied bird population in winter than in summer and give rise to speculation as to what movement takes place to produce this result. An uncomplicated coastwise movement might be suspected but D. L. Serventy (*Emu*, vol. 37, 1938, p. 269) found a similar decline in summer population in King's Park, Perth. The hypothetical movement may be southward, but this is pure speculation. Actually, I am inclined to think that relatively unfavourable observing conditions connected with the seasonal inactivity of the birds contribute to the lower summer totals and that the difference is more apparent than real. Nevertheless, a significant difference does appear to exist and requires explanation.

The investigation would have to be extended considerably to enable accurate conclusions to be drawn. At the same time it is felt that the figures presented give a clearer picture of the bird population than could have been obtained by more subjective methods of birdwatching.

GRASS AND BIRDS

By C. B. PALMER, Bassendean

The number of seed-eating birds found in the southern part of Western Australia is small compared with that found in Britain or Western Europe, the reason being that the native vegetation is largely scrub and there is a paucity of species of grasses bearing edible seeds. In the northern part of the State the position is different, for there are vast grassy plains and open savannah, and the population of granivorous birds is large, both in number of

species and number of individuals. The cause of this difference of vegetation, and consequently of bird population, is climatic, but it is less obvious why we do not get many suitable types of grasses for birds in the South-west.

A study of the order Gramineae, to which all true grasses belong, throws some light on the problem. There are nearly 6,000 species, and nearly 500 genera, which are divided into 15 tribes, but for our present purpose it is sufficient to recognise two main divisions. (1) Pooideae. The grasses of this division grow the best seeds on the outside of each spikelet, and the florets are reduced towards the middle. Most species have seven as the basic chromosome number. As a general (but not universal) rule they favour temperate climates, and the temperate zone cereals, wheat, oats, barley and rye belong to this division. (2) Panicoideae. These grasses have the outer florets reduced, or absent, and bear the main seed in the middle of the spikelet. The basic chromosome number is most frequently five. They are generally (but not always) tropical or semi-tropical, and include maize and the various sorghums and millets. The bulk of our northern grasses belong to the Panicoideae, and the seeds are the main food of the many kinds of weaver-finches (Ploceidae) and other granivorous birds in northern latitudes of Australia.

The European finches (Fringillidae) in their natural habitat live on grass seeds (which are mainly species of Pooideae) but partake also of the seeds of the plants of other orders. It is only in the last few hundred years that most of the forests of Europe have been cleared, with a consequent increase of grasses and ruderal weeds. This abundant food supply was directly responsible for the great increase of seed-eating birds.

It is to be expected that the balance of bird life will change in a similar way in the south of Western Australia, as clearing and cultivation proceeds. But it must be remembered that our climate is sufficiently mild and equable to suit both types of grasses, and there are many introduced representatives of each division well established. So will this increase of seed-eating birds consist of native species, exotic species (goldfinches are already acclimatised) or both? And will they retain their food preferences? In this connection it is interesting to note that aviculturists find that canaries and European finches in captivity, retain their liking for canary seed (*Phalaris canariensis*) and others belonging to the Pooideae and certain Cruciferous and Compositous seeds, while the native weaver-finches prefer millet (*Panicum miliaceum*) and others belonging to the Panicoideae. One question is of paramount economic importance—will the greater number of seed-eating birds suppress the insectivorous species and lead to an increase of noxious insects? We cannot be sure, but there is some hope in the fact that many birds which are principally granivorous, will, particularly in the breeding season, vary their diet by eating insects.